



## **Effects of Visual, Auditory, and Tactile Alerts on Platoon Leader Performance and Decision Making**

**by Andrea S. Krausman, Linda R. Elliott, and Rodger A. Pettitt**

**ARL-TR-3633**

**December 2005**

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**Human Research and Engineering Directorate, ARL**

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14. ABSTRACT The U.S. Army Future Combat System (FCS) proposes the use of advanced communications and technologies that will provide Soldiers with instant access to large amounts of information. Conveying information in a manner that enhances a Soldier's ability to manage the information and in turn, increases his or her situational awareness is problematic, especially when we consider the high operational tempo, uncertainty, and stress of combat. Past research suggests that multi-sensory information display may be an effective technique for enhancing the information management and situational understanding of Soldiers. A study was conducted to examine the effects of multi-sensory alerts on platoon leader decision making and performance. Twelve platoon leaders completed three simulated missions. During each mission, participants received tactical communications and monitored activity on their displays. Tactical communications were accomplished via digital messaging and voice commands. Some of the digital messages were preceded by a visual, auditory, or tactile alert. Time to respond to each of the digital messages was measured. The results indicate that when a platoon leader is engaged in visually demanding tasks such as scanning displays, response time can be as much as 54% slower for a visual alert. Subjective data indicated that participants thought the visual alerts were not as effective or helpful as auditory or tactile alerts. Applications of this research include the development of display design guidelines that will transition to FCS equipment developers.					
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## 1. Background

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Modern combat represents a highly complex task environment that poses many significant challenges for Soldiers. For example, during a combat situation, there is a variety of sources of information that a single Soldier must attend to and comprehend, which becomes especially problematic when we consider the high operational tempo, uncertainty, and stress of combat. In addition, technological advancements as well as the need to ensure that our forces are equipped for future conflicts have led the Army to invest in the development of Future Combat Systems (FCS). At the heart of FCS is the command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) system that will provide advanced communications and technologies to link Soldiers with manned and unmanned ground and air platforms and sensors. FCS-equipped units must therefore handle a large amount of battlefield information.

The information provided by the C4ISR architecture is an important factor in the maintenance of situational understanding on the battlefield. However, “pushing” large amounts of information to the Soldier may not enhance his or her situational understanding. Rather, there are certain pieces of information that are critical for Soldiers to make adequate decisions and successfully complete their mission and should therefore be readily available. The method of information presentation is another consideration. Within FCS, digitized battlefield information is conveyed to Soldiers by an array of computer displays, which relies heavily on the visual modality. Traditionally, system designers use the visual modality as the main presentation channel, and other modalities are either ignored or used insufficiently, causing confusion and increased workload (Brickman, Hettinger, & Haas, 1999). In order to address the issues associated with information display for FCS systems, an Army technology objective (ATO) was developed. The ATO supports research focused on reducing the potential mental workload of Soldiers who often perform multiple tasks simultaneously. A review of the literature about information processing suggests that Multiple Resource Theory (MRT) may be a useful tool in designing interfaces for applications in which operators perform several tasks at the same time (Boles, 2001). The following section gives a brief discussion of MRT and how it was applied to this project.

### 1.1 Theoretical Basis

A fundamental goal for ATO display investigations is to support Soldiers in high workload situations. Display interventions have been particularly effective in situations when operators have multiple demands for attention. MRT proposes that humans have a finite capacity for processing information and suggests distributing tasks and information across the various sensory modalities (Wickens, 1991). For example, if an operator is asked to perform two concurrent tasks, the performance of one or both of the tasks may suffer because each task has fewer available resources than when each task was performed separately (Mitchell, 2000). Off-loading some of the information to other modalities can reduce dual task interference, which

should lead to more efficient processing and improve task-sharing performance (Sklar & Sarter, 1999). To a limited extent, the military domain has implemented a multi-sensory information presentation approach. For example, system designers are using auditory alerts in addition to traditional focal visual displays (Nikolic & Sarter, 2001; Weinstein & Wickens, 1992; Bolia, D'Angelo, and McKinley, 1999). However, an operator may encounter situations in which his or her visual and auditory channels are heavily loaded. In these situations, it may be beneficial to include the tactile modality (Sklar & Sarter, 1999). Recently, tactile displays have been used as communication systems for pilots and astronauts to aid in spatial orientation by providing directional cues (Jones & Nakamura, 2003; Gilliland & Schelgel, 1994) and as a navigational aid (van Erp, 2005; Elliott, Redden, Krausman, Carstens, & Pettitt, 2005).

In summary, there are challenges involved in conveying battlefield information to the Soldier in a manner that enhances his or her ability to manage the information and in turn, increases situational awareness. The research cited suggests that multi-sensory information display may be an effective technique for enhancing the information management and situational understanding of Soldiers. Therefore, the goal of this project is to use the principles outlined in MRT to guide development of displays for presenting critical information to the platoon leader, thereby increasing system performance. Results of this project will support development of display design guidelines that will transition to FCS developers.

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## **2. Objective**

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The objective of this evaluation was to examine the effects of visual, auditory, and tactile alerts on platoon leader decision making in event-based scenarios.

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## **3. Method**

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### **3.1 Participants**

Twelve infantry officers (11A), recent graduates of the Infantry Officer Advanced Course (IOAC), volunteered to participate in this study. All participants met the vision and hearing requirements outlined in the infantry physical profile: visual acuity of 20/200, correctable to 20/20 in each eye, and an audiometer average level for each ear not more than 25 dB at 500, 1000, 2000 Hz with no individual level greater than 30 dB, and not over 45 dB at 4000 Hz. Participants ranged in age from 25 to 35 years (mean = 29.5, standard deviation [SD] = 3.3).

The voluntary, fully informed consent of the persons used in this research was obtained as required by 32 Code of Federal Regulations 219 and Army Regulation (AR) 70-25 (appendix A). The investigators adhered to the policies for the protection of human subjects as prescribed in AR 70-25. Participants did not receive monetary compensation for their participation and were free to withdraw from the study at any time without penalty. A coding scheme was used to identify the data by participant number only (i.e., subject 1) to maintain confidentiality. All photographs taken during the course of the study were modified to ensure that participants could not be identified.

## 3.2 Apparatus

### 3.2.1 Scenarios

Three scenarios (table 1) developed in collaboration with subject matter experts (SMEs) ensured realism and mission relevance. For each scenario, experienced infantry platoon leaders (PL) played the role of the PL mounted inside a vehicle and performed typical mission-related tasks such as communications, monitoring tactical information on computer displays, and command decision making. These tasks were based on SME interviews and data from an Improved Performance Research Integration Tool (IMPRINT) task network model (Mitchell, Samms, Glumm, Krausman, Brelsford, & Garrett, 2004). Researchers played the roles of infantry company commander (CO), infantry squad leader (SL), infantry platoon sergeant (PSG), and robotics non-commissioned officer (NCO). Scripts were developed to direct the order of scenario events and communications (appendix B). All PL actions and communications were unscripted.

Table 1. Mission scenarios and events.

Scenario	Scenario events
1	Indirect fire, direct fire, danger area and improvised explosive device (IED)
2	Direct fire, disabled infantry carrier vehicle (ICV), danger area/chemical attack
3	Obstacle and direct fire, indirect fire chemical attack, mine field

### 3.2.2 Alerts

Visual, auditory, and tactile alerts signaled the PL of incoming messages (table 2). When alerted of an incoming message, the PL clicked the “show message” button on the communication window of the primary display to receive the content of the message. Alerts were continuous and stopped when the participant clicked the show message button.

Table 2. Description of alert purpose and presentation.

Alert purpose	Alert presentation
1. To alert platoon leader of an incoming message.	<b>Visual alert</b> – solid red box appears on bottom portion of communications console of primary display. <b>Auditory alert</b> – “beep” from headset <b>Tactile alert</b> – “buzz” from tactile armband

Tactile sensors (see figure 1) developed by Dr. Lynette Jones at the Massachusetts Institute of Technology under the Advanced Decision Architectures Collaborative Technology Alliance (ADA CTA) were used to present tactile alerts to the PL (Lockyer, 2004). The tactile sensors, called “tactors,” are small electro-mechanical vibrators that use the same DC motor used in cell phones. A Lycra<sup>1</sup> sleeve worn on the upper arm encapsulates the tactors.

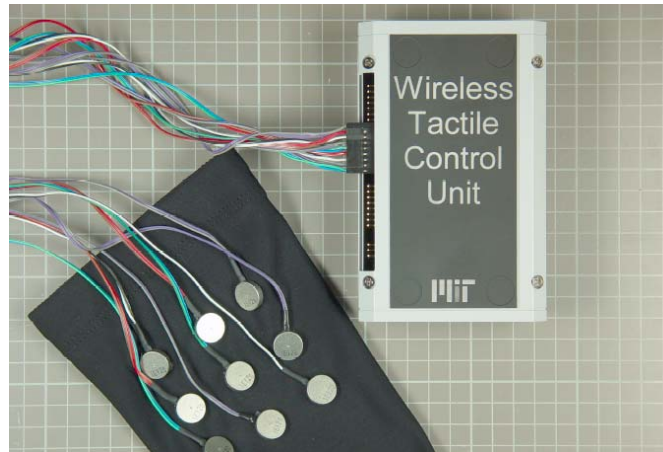


Figure 1. Tactors and wireless tactile control unit.

### 3.2.3 Simulation Platform

The M-Body AEDGE<sup>2</sup> (Agent-Enhanced Decision Guide Environment) simulation platform used for this study (see figure 2) was developed by 21st Century Systems, Inc., under a Phase II Small Business Innovative Research (SBIR) program, sponsored by the Army Tank-Automotive and Armaments Command-Armament Research, Development, and Engineering Center (TACOM-ARDEC). The program simulated three movement-to-contact scenarios and consisted of two interconnected workstations with 17-inch flat panel monitors and a 48-inch flat panel for three-dimensional (3-D) graphics. Each station provided users with (a) two-dimensional (2-D) and 3-D map views with grid coordinates; (b) communications via voice and text messaging; (c) visual, auditory, and tactile cues; (d) vehicle movement; (e) terrain information; (f) mission-specific icons and graphics; and (g) unmanned aerial vehicle (UAV) views (see figures 3 and 4). Keyboard commands controlled the movement of vehicles in the simulation. Communications were sent by text messaging or voice via a headset. Alerts (visual, auditory, and tactile) signaled incoming information. A pull-down menu allowed selection of desired alert type.

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<sup>1</sup>Lycra is a registered trademark of E.I. DuPont de Nemours & Co., Inc.

<sup>2</sup>AEDGE is a registered trademark of 21st Century Systems, Inc.

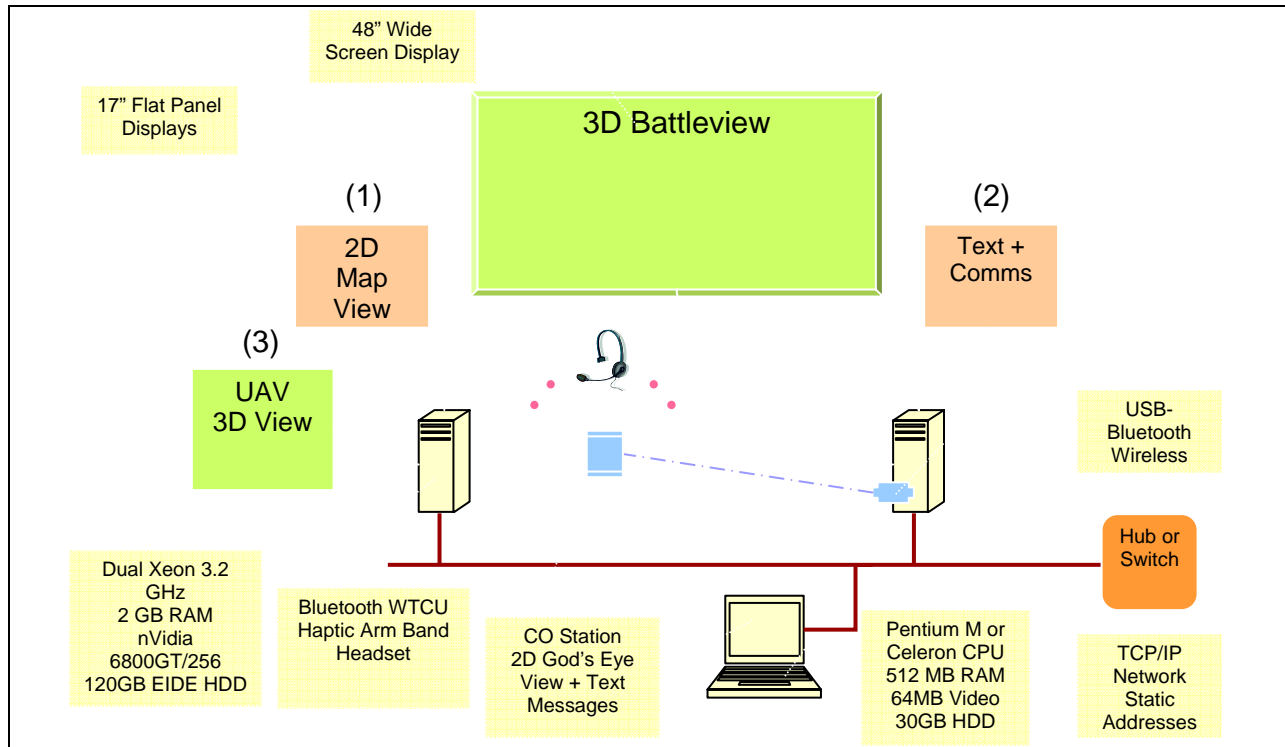


Figure 2. M-Body AEDGE simulation platform.

1. 2-D Map View: displayed map graphics such as grid coordinates, line of departure, objectives, friendly and enemy positions, obstacles, etc.
2. Text + Comms: displayed communications sent and received during missions. The CO and PSG sent digital messages. In order to see the contents of a digital message, the participants pressed the “show message” button at the bottom of the communications display. All communication between the SL and PL was by simulated radio (verbal).
3. UAV 3-D View: displayed images of the battlefield from a simulated UAV.

MBody/DSS -- jeff

Action Display Agents ROE Zones Peripherals Accessories User Bluetooth Alert Help

Warning: **WHITE** Weapons: **HOLD**

View Bearing 300 Attack Angle .002 Altitude 1067.04(ft)

Map Grid History Plans Markers AOR AOI Assign Ranges Heading Agent Tracks Labels Own ViewPt Location

Track # 1304  
Range 0.0  
Altitude 1063.0 ft  
ID Friend  
Spec. Platform FCS  
Platform FCS  
Location 37° 38' 59" N 092° 00' 22" W  
Heading(Ct) 299.8  
Speed 9.9  
Fuel 49999

Track Information

Track Number: 1304  
Latitude: 37° 38' 59" N  
Longitude: 092° 00' 22" W  
Bearing: 300  
Heading(Ct): 300  
Altitude(Ab): 1063 feet  
Fuel (Bs): 49999

ID: Friend  
Range(Fb):  
Speed(Knots): 9.9 kts  
Spec. Platform: FCS  
Platform: FCS

Change Confirm

Recommendation Window

Time	ID	Description	Accepted

Accept

ae Comms

18:00:04 [AUTO]: This is a message sent over the panel.

ID	Freq	Status	Xmit	Recv
CommBlue	123.0 MHz	On	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
CommAll	128.0 MHz	On	<input type="checkbox"/>	<input type="checkbox"/>
CommRed	113.0 MHz	On	<input type="checkbox"/>	<input type="checkbox"/>

This is a message sent over the panel. ☐ Alert

Mic Alert Send

Close

(C) 2004, 21st Century Systems, Inc. AUTO. This is a message sent over the panel. 00:00:04Z (10/11)

Figure 3. Screen shot of platoon leader's primary display and communications window.



Figure 4. Screen shot of UAV display.

### 3.2.4 Questionnaires

Two questionnaires evaluated participant performance:

- a. **Alert evaluation** – Participants rated the effectiveness, helpfulness, and necessity of the audio, tactile, and visual alerts using a 5-point Likert scale in which 1 = strongly agree and 5 = strongly disagree (appendix C).
- b. **Alert ranking** – Participants ranked the effectiveness, and helpfulness of the visual, auditory, and tactile alerts from 1 to 3 (appendix D).

**Health and Demographics Questionnaire** – Participants provided information about their current medical condition, gender, age, length of service, education level, and combat experience (appendix E).

## 3.3 Experimental Design

### 3.3.1 Independent Variable

A one-way within-subjects design was used with alert type (auditory, visual, and tactile) as the independent variable. Presentation order for alert type and scenario was counterbalanced with a balanced Latin square (table 3).

Table 3. Presentation Order.

Participant	Alert	Scenario	Alert	Scenario	Alert	Scenario
1,7	Visual	1	Tactile	2	Auditory	3
2,8	Auditory	2	Visual	3	Tactile	1
3,9	Tactile	3	Auditory	1	Visual	2
4,10	Visual	1	Auditory	3	Tactile	2
5,11	Auditory	2	Tactile	1	Visual	3
6,12	Tactile	3	Visual	2	Auditory	1

### 3.3.2 Dependent Variables

Response time and the subjective alert ratings and rankings were the dependent variables. Response time was defined as the time between the Soldier receiving an alert and clicking the show message button on the communications display.

### 3.4 Procedures

Before the experiment began, participants completed an informed consent form and a demographic questionnaire and received a short briefing about the experimental purpose, procedures, and equipment. Each participant was assigned to the operational scenarios (table 3) and read an operations order (OPORD) that described his mission and objectives (appendix F). All three scenarios used the same OPORD. During the experiment, participants sat in front of the primary display, map display, and UAV display. During each scenario, participants received tactical communications and monitored activity on their displays. An alert (visual, auditory, or tactile) preceded some of the communications. When the PL received an alert, he clicked in the communications console of his primary display to see the new message and made a decision based on the new information. For example, if the PL receives a message that indicates there is a dirty area ahead, he may decide to change course and notify his platoon. Approximately nine alerts were given for each scenario. The M-Body software recorded response time. Participants continued their mission until they reached the objective, at which time, they completed the alert evaluation. Participants took a short break between scenarios. This procedure was repeated until all three scenarios were completed, which took approximately 1.5 hours. After completing all three conditions, participants answered the alert ranking questionnaire.

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## 4. Results

### 4.1 Objective Data

A reciprocal transformation (Howell, 1997) of the response time data was performed to meet analysis of variance (ANOVA) model assumptions (summary results are presented in original units) and these data were analyzed with a one-way ANOVA with alert type as the independent variable. Results showed a significant main effect of alert type,  $F(2, 18) = 13.69, p = .0002$ .

*Post hoc* tests using Tukey's HSD (Honestly Significant Difference) test revealed that the mean response time for the visual alert was significantly longer than the response times for the auditory and tactile alerts (see figure 5). No significant differences were found between the auditory and tactile alert response time ( $p = .2146$ ). A closer examination of the means showed a larger dispersion of response times for the visual alert, with 8 of the 12 subjects having a response time of greater than 10 seconds. Only one subject had a response time of greater than 10 seconds for the tactile alert, and for the auditory alert, all response times were less than 10 seconds.

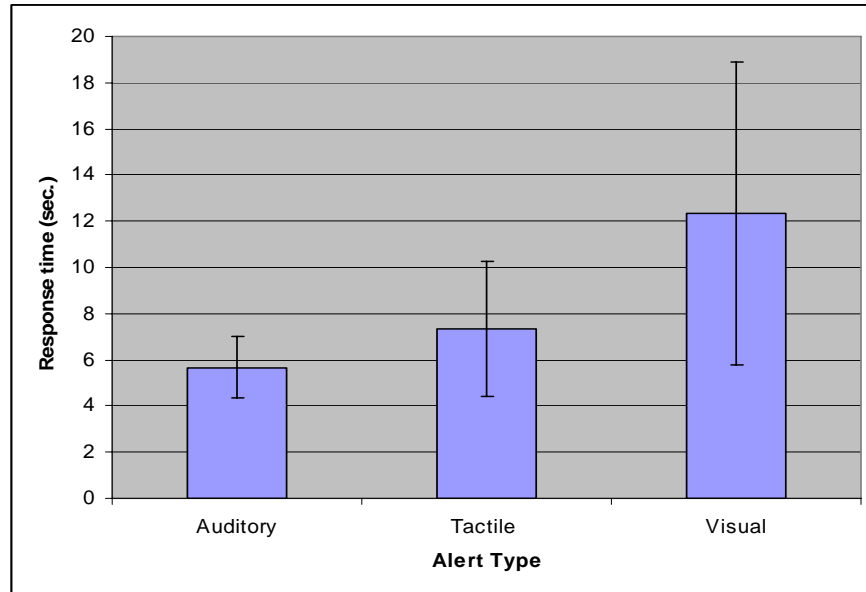


Figure 5. Mean (SD) response time for each alert type.

## 4.2 Subjective Data

### 4.2.1 Item 1: Alert Was Effective in Getting my Attention

Alert type,  $F(2, 22) = 16.10$ ,  $p < .0001$ , had significant effects on item 1. Mean ratings were significantly lower for the auditory and tactile alerts (figure 6), suggesting that participants thought that the auditory and tactile alerts were more effective at getting attention than the visual alert.

### 4.2.2 Item 2: Alert Was Helpful

No significant effects of alert type were found on Item 2 ( $p = 0.059$ ). Mean (SD) ratings for the alert types were as follow: auditory = 1.67 (0.65), tactile = 2.25 (1.06), and visual = 2.5 (0.90).

### 4.2.3 Item 3: Alert Was Annoying and Unnecessary

No significant effects of alert type were found on Item 3 ( $p = 0.088$ ). Mean (SD) ratings for the alert types were as follow: auditory = 3.75 (0.97), tactile = 3.58 (0.99), and visual = 3.67 (0.98).

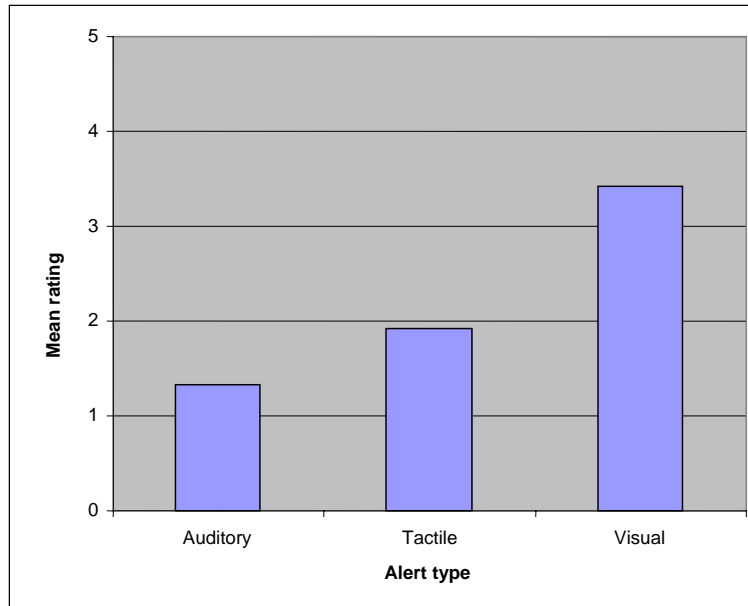


Figure 6. Mean (SD) rating for effectiveness in getting attention.

### 4.3 Preference Rankings

Frequency counts helped identify the type of alert that participants considered the best, next best, and worst choice for getting their attention and helpfulness. For getting attention (figure 7), participants chose the auditory alert as the most effective at getting their attention. The auditory and tactile alerts tied as next best choice, and the visual alert was the least effective at getting the participant's attention. With respect to the helpfulness of alerts (figure 8), the tactile alert was most helpful, followed by the auditory alert as the next best. Participants thought the visual alert was the least helpful.

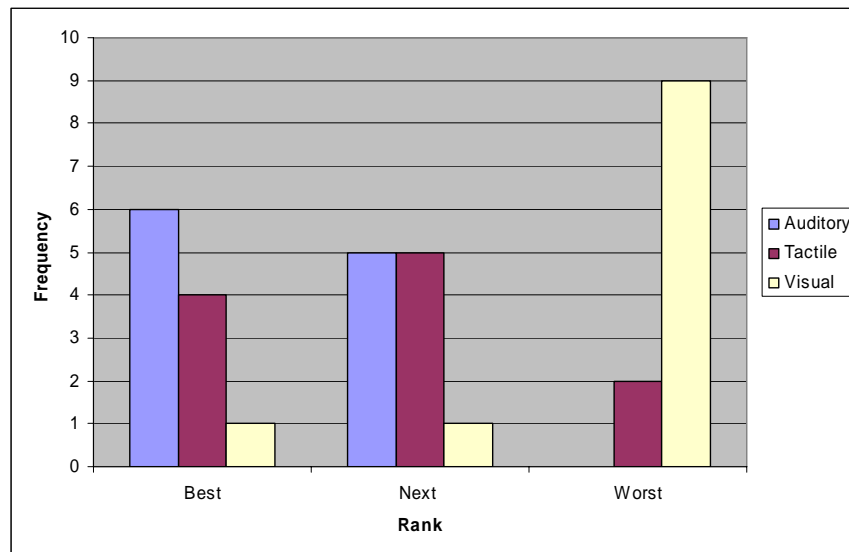


Figure 7. Frequency counts for effectiveness of alert in getting attention.

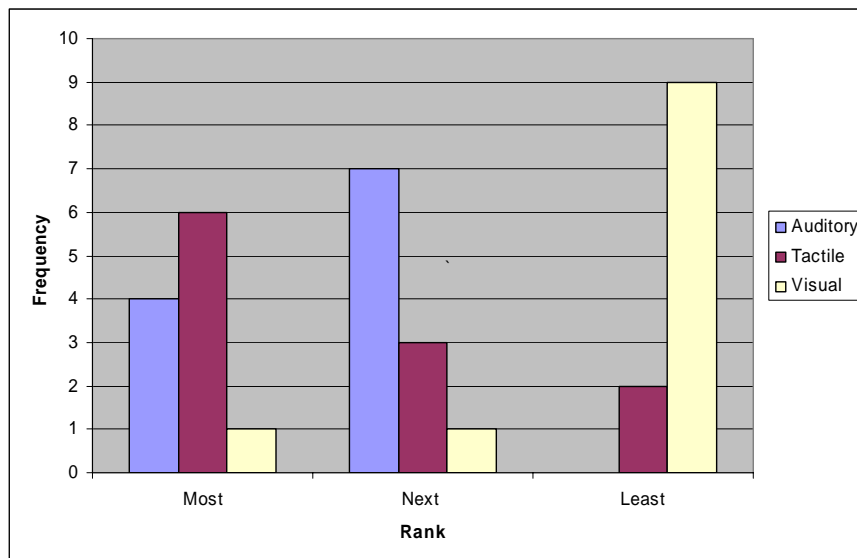


Figure 8. Frequency counts for helpfulness of alerts.

#### 4.4 Participant Comments

Participants indicated that the visual alert was not very effective at getting their attention, which corresponds to the findings of the objective data. Preference data showed that participants favored the auditory and tactile alerts because they easily got their attention but did not interfere with concurrent tasks. Participants also noted that caution should be exercised when auditory and tactile alerts are implemented in combat vehicles. For example, environmental noise and the use of multiple radio nets within a vehicle may mask the auditory alert. In addition, the tactile alert may be difficult to detect in a moving vehicle because of vehicle vibration. Participants suggested that a combination of alerts might be the best option.

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### 5. Discussion

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Many challenges exist when one is designing interfaces that provide sensory feedback, especially when we consider that many interfaces rely heavily on the visual channel, which can easily become overloaded (Hopp, Smith, Clegg, & Heggstad, 2005). As mentioned previously, the literature about information processing suggests that MRT may be a useful tool in designing interfaces for applications in which operators perform several tasks at the same time (Boles, 2001). For example, since the PL's visual channel is overloaded, distributing tasks and information across other sensory modalities may help reduce overall workload (Wickens & Hollands, 2000; Sarter, Waters, & Ho, 2003). This study used the principles of MRT to examine the effects of single alerts (visual, auditory, and tactile) on PL decision making and performance. Results showed that response time for the visual alert was 54% slower than the auditory and 41%

slower than the tactile alert, which was expected because the PL was already engaged in visually demanding tasks, such as monitoring remote operations and scanning tactical displays. In addition, these results are consistent with other findings in the literature, which suggest that auditory and tactile alerts are effective “attention grabbers” (Helleberg & Wickens, 2001). For example, auditory cues such as speech and non-speech auditory alerts or warnings can attract attention to a situation, control, or display (Laughery & Wogalter, 1997; Haas & Edworthy, 2003; Bolia et al., 1999). Tactile displays can alert pilots of possible threats or other situations that may occur during a mission, especially when the visual channel is already overloaded or unavailable (Gilliland & Schlegel, 1994).

Subjective data also indicated that participants preferred the auditory and tactile alerts because they easily got their attention but did not interfere with concurrent tasks. The literature describes this type of alert as an ideal alert or interruption: one that minimally distracts ongoing task performance while providing a clear signal of another source requiring the individual’s attention (Hopp et al., 2005). In addition, the auditory and tactile alerts elicited a significantly faster response time. However, the implementation of auditory and tactile alerts in moving combat vehicles could be problematic because of environmental noise and vibration, which would make the alerts difficult to detect. As a result, a redundant combination of display modalities may be an effective alternative to presenting information to a single modality. For example, a combination of cues would enable a PL to hear a message or alert while he continues to scan the battlefield but would also enable him to see the information being displayed, if necessary (Helleberg & Wickens, 2001). Wickens and Hollands (2000) suggest that redundantly coding targets across modalities (visual warning coupled with an auditory beep) shortens response time. Redundancy can also aid visual search and detection of changes that occur on complex visual displays (Tan, Gray, Young, & Irawan, 2001).

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## **6. Conclusions and Future Work**

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The results of the present study provide useful information that can help establish guidelines for the development of interfaces that provide sensory feedback. Specifically, the results show that when a platoon leader is engaged in visually demanding tasks such as scanning displays, visual alerts lead to a longer response time and are not as effective or helpful as auditory or tactile alerts. Combinations of alerts may ease some of the challenges, namely, environmental noise and vehicle vibration associated with the implementation of auditory and tactile alerts in combat vehicles. Future research will examine the effectiveness of combined alerts and the signal characteristics that enhance the detection of tactile cues in moving vehicles.

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## Appendix A. Volunteer Agreement Affidavit

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### VOLUNTEER AGREEMENT AFFIDAVIT:

ARL-HRED Local Adaptation of DA Form 5303-R. For use of this form, see AR 70-25 or AR 40-38

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The proponent for this research is:	<b>U.S. Army Research Laboratory Human Research and Engineering Directorate Aberdeen Proving Ground, MD 21005</b>
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Authority:	Privacy Act of 1974, 10 U.S.C. 3013, [Subject to the authority, direction, and control of the Secretary of Defense and subject to the provisions of chapter 6 of this title, the Secretary of the Army is responsible for, and has the authority necessary to conduct, all affairs of the Department of the Army, including the following functions: (4) Equipping (including research and development), 44 USC 3101 [The head of each Federal agency shall make and preserve records containing adequate and proper documentation of the organization, functions, policies, decisions, procedures, and essential transactions of the agency and designed to furnish the information necessary to protect the legal and financial rights of the Government and of persons directly affected by the agency's activities]
Principal purpose:	To document voluntary participation in the Research program.
Routine Uses:	The SSN and home address will be used for identification and locating purposes. Information derived from the project will be used for documentation, adjudication of claims, and mandatory reporting of medical conditions as required by law. Information may be furnished to Federal, State, and local agencies.
Disclosure:	The furnishing of your SSN and home address is mandatory and necessary to provide identification and to contact you if future information indicates that your health may be adversely affected. Failure to provide the information may preclude your voluntary participation in this data collection.

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#### Part A • Volunteer agreement affidavit for subjects in approved Department of Army research projects

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Title of Research Project:	Effects of visual, auditory, and tactile alerts on platoon leader task performance and decision cycle time.	
Human Use Protocol Log Number:	<b>ARL-20098-05016</b>	
Principal Investigator:	Andrea S. Krausman, U.S. Army Research Laboratory Human Research and Engineering Directorate	Phone: 410-278-5933 E-Mail: ahynes@arl.army.mil
Associate Investigator(s)	Dr. Linda Elliott U.S. Army Research Laboratory Human Research and Engineering Directorate	Phone: 706-545-9145
Location of Research:	U.S. Army Research Laboratory, Fort Benning, GA	
Dates of Participation:	March 14 – March 18	

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**Part B • To be completed by the Principal Investigator**

Note: Instruction for elements of the informed consent provided as detailed explanation in accordance with Appendix C, AR 40-38 or AR 70-25.

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**Purpose of the Research**

The purpose of this experiment is to evaluate the effectiveness of visual, auditory, and tactile alerts on your ability to accomplish a mission.

**Procedures**

Before beginning the experiment, you will be complete a short training session so that you can become familiar with the visual, auditory, and tactile (vibration) alerts. For the experiment, you will assume the role of a platoon leader and will carry out three missions, while seated in front of a map display, comms display, and UAV display. You will be given a short operations order (OPORD) that describes your mission and objectives. During each mission, you will receive tactical communications via the radio and text messaging. You will also be monitoring activity on your displays. Some of the text messages will be preceded by an alert (visual, auditory, or tactile). Visual alerts appear as a red light on the bottom of the communications display. Tactile alerts (a series of buzzes) will be presented by small mechanical motors encapsulated in a lycra sleeve worn on your upper arm. Auditory alerts will be presented as a series of “beeps” that you will hear in your headphones. When the alert is given, you will click the “show message” button on the communications console of your primary display to see the new message. You may be required to make a decision based on the information presented in the message. There are approximately 10 alerts given for each mission. The software will log the timing of events and actions taken. You will continue your mission until you reach the objective at which time you will fill out a scenario event questionnaire and alert evaluation. A short break will be given and you will move on to the next scenario. After completing all three missions, you will complete two questionnaires to obtain your opinion about the effectiveness of the alerts, and a rating of your performance. The entire experiment will take approximately 1.5 hours to complete.

**Benefits**

You will receive no benefits from participating in the project, other than the personal satisfaction of supporting the development of effective displays for Future Combat Systems (FCS).

**Risks**

Risks associated with this study are minimal, and are similar to those encountered when seated in front of a computer (i.e. eye strain). The tactile sensors, called tactors, are small electromechanical vibrators that use the same DC motor used in cell phones and pagers, so there is no danger posed by the vibrations.

**Confidentiality**

All data and information obtained about you will be considered privileged and held in confidence. Complete confidentiality cannot be promised, particularly if you are a military service member, because information bearing on your health may be required to be reported to appropriate medical or command authorities. In addition, applicable regulations note the possibility that the U.S. Army Medical Research and Materiel Command (MRMC-RCQ) officials may inspect the records.

**Disposition of Volunteer Agreement Affidavit**

The Principal Investigator will retain the original signed Volunteer Agreement Affidavit and forward a photocopy of it to the Chair of the Human Use Committee after the data collection. The Principal Investigator will provide a copy of the signed and initialed Affidavit to you.

#### Contacts for Additional Assistance

If you have questions concerning your rights on research-related injury, or if you have any complaints about your treatment while participating in this research, you can contact:

**Chair, Human Use Committee**  
**U.S. Army Research Laboratory**  
**Human Research and Engineering Directorate**  
**Aberdeen Proving Ground, MD 21005**  
**(520) 538-4705 or (DSN) 879-4705**

**OR Office of the Chief Counsel**  
**U.S. Army Research Laboratory**  
**2800 Powder Mill Road**  
**Adelphi, MD 20783-1197**  
**(301) 394-1070 or (DSN) 290-1070**

I do hereby volunteer to participate in the research project described in this document. I have full capacity to consent and have attained my 18th birthday. The implications of my voluntary participation, duration, and purpose of the research project, the methods and means by which it is to be conducted, and the inconveniences and hazards that may reasonably be expected have been explained to me. I have been given an opportunity to ask questions concerning this research project. Any such questions were answered to my full and complete satisfaction. Should any further questions arise concerning my rights or project related injury, I may contact the **ARL-HRED Human Use Committee Chairperson at Aberdeen Proving Ground, Maryland, USA by telephone at (520) 538-4705 or DSN 879-4705**. I understand that any published data will not reveal my identity. If I choose not to participate, or later wish to withdraw from any portion of it, I may do so without penalty. I understand that military personnel are not subject to punishment under the Uniform Code of Military Justice for choosing not to take part as human volunteers and that no administrative sanctions can be given me for choosing not to participate. I may at any time during the course of the project revoke my consent and withdraw without penalty or loss of benefits. However, I may be required (military volunteer) or requested (civilian volunteer) to undergo certain examinations if, in the opinion of an attending physician, such examinations are necessary for my health and well being.

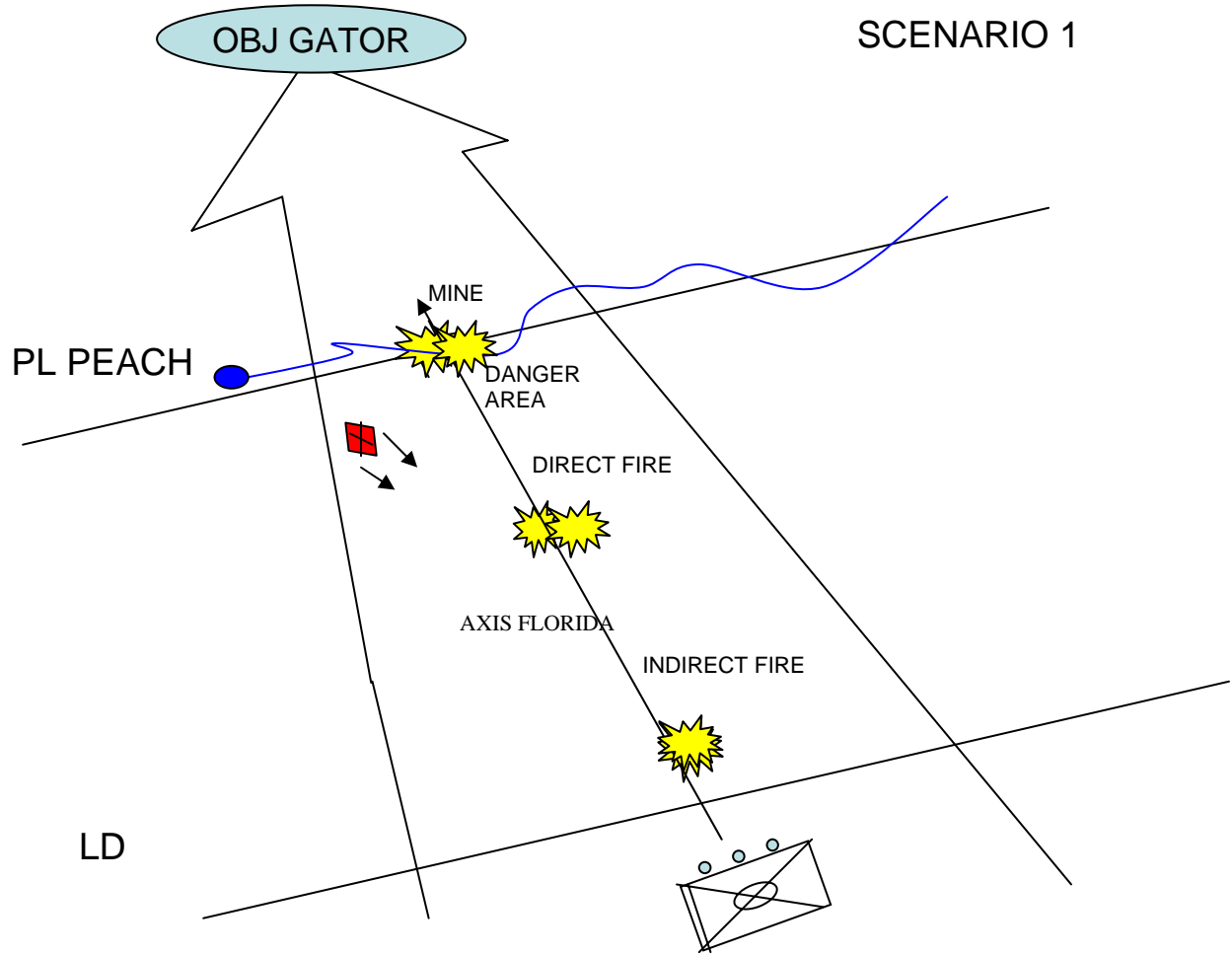
<i>Printed Name Of Volunteer (First, MI., Last)</i>	
<i>Social Security Number (SSN)</i>	<i>Permanent Address Of Volunteer</i>
<i>Date Of Birth (Month, Day, Year)</i>	
<i>Today's Date (Month, Day, Year)</i>	<i>Signature Of Volunteer</i>
<i>Signature Of Administrator</i>	

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## Appendix B. Scenarios

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# SCRIPT 1

(Bold text indicates when an alert was given)

(Blue text shows a sample of the unscripted platoon leader communications)

**CO (to PL): On order, cross LD and report when all elements are across**

PL to CO: Roger, will report when all elements are across

PL (to SL): Repeats message “on order...”

**CO (to PL): Cross LD now, and report when all elements are across**

PL (to SL): Orders SLs to cross LD

SL (to PL): 2<sup>nd</sup> platoon has crossed LD

PL (to CO): Informs CO of crossing

SL (to PL): Receiving indirect fire

PL (to SLs): Move through impact area

SL (to PL): Roger, main gun down

**CO (to PL): FRAGO: Enemy strong point detected – grid 856688, report contact, destroy strong point, and continue mission to objective gator.**

PL (to CO): 2<sup>nd</sup> platoon indirect fire contact and main gun down on ICV

PL (to CO): Roger, received FRAGO

PL (to SLs): FRAGO: Enemy strong point detected – grid 856688, report contact, destroy strong point, and continue mission to objective gator.

SL (to PL): Roger, received FRAGO

SL (to PL): Enemy strong point destroyed

PL (to SL): acknowledges SL and reports enemy strong point destroyed

PL (to CO): reports enemy strong point detected

SL (to PL): Enemy at 10 o'clock taking direct fire, we are engaging enemy

**PSG(to PL): FM commo down and we have 2 casualties requiring evacuation.**

1<sup>st</sup> SL (to PL): ICV disabled

PL (to CO): Reports contact, disabled ICV, and casualties

SL (to PL): Enemy withdrawing, we are in pursuit

PL (to SL): Roger, continue to pursue

**PSG (to PL): We have one additional casualty requiring MEDEVAC**

**CO (to PL): Break contact/cross load disabled ICV and continue across Peach to consolidate and evacuate casualties.**

PL (to CO): Roger, wilco

PL (to SLs): Cross load, break contact, and continue across PL Peach to consolidate and evacuate casualties.

SL (to PL): Roger

SL (to PL): Cross load complete

**PSG (to PL): Casualties stabilized**

PL (to CO): Cross load complete, casualties stabilized, proceeding to PL Peach.

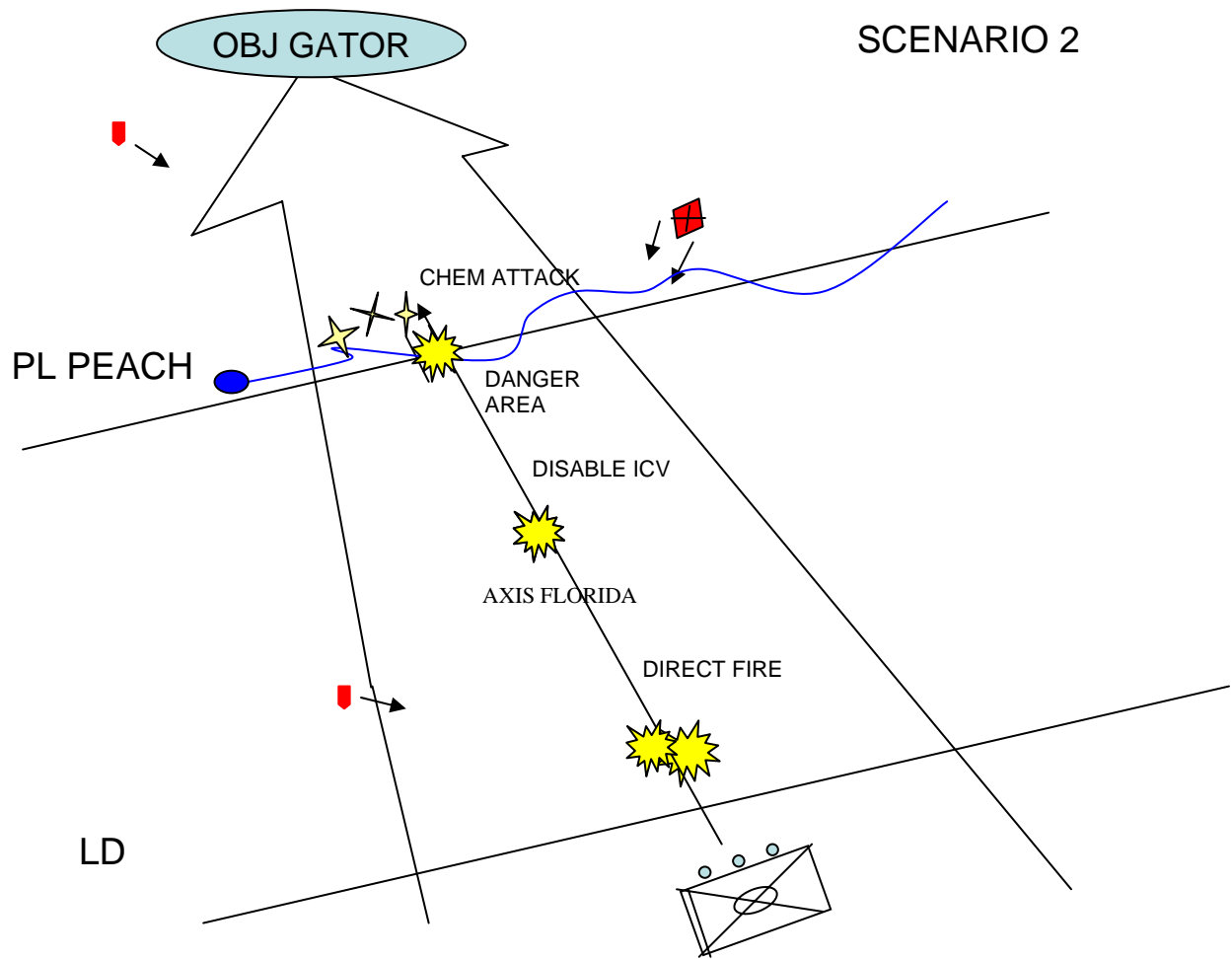
**CO (to PL): FRAGO: Consolidate in place and on order be prepared to assume support for 1<sup>st</sup> platoon attack of Objective Bulldog.**

2<sup>nd</sup> SL (to PL): 3<sup>rd</sup> squad ICV hit mine and is destroyed

**PSG (to PL): All personnel in 3<sup>rd</sup> squad killed**

2<sup>nd</sup> SL (to PL): Enemy contact at bridge, engaging enemy at this time

PL (to CO): Acknowledges FRAGO, reports enemy contact, ICV destroyed by mine, all personnel killed.



## SCRIPT 2

(Bold text indicates when an alert was given)

(Blue text shows a sample of the unscripted platoon leader communications)

**CO: On order, cross LD and report when all elements are across**

PL to CO: Roger will report when all elements are across

PL to SLs: On order cross LD and report when all elements are across

SLs to PL: acknowledge

**CO to PL: Cross LD now**

PL to SLs: Cross LD now

2nd SL to PL: 2<sup>nd</sup> Platoon has crossed LD

PL to CO: 2<sup>nd</sup> Platoon has crossed LD

2ndSL to PL: Receiving enemy fire from 9 o'clock

**PSG to PL: Driver has been killed and replaced**

1SL to PL: Maneuvering toward enemy position

PL to CO: Reporting contact with enemy

2<sup>nd</sup> SL to PL: Vehicle is disabled – can't proceed w/ mission

**CO to PL: Bypass contact adjacent unit will engage enemy**

PL to CO: Acknowledge order and reports disabled vehicle

RNCO to PL: Enemy tank section spotted by UAV at 3km and closing in, grid 824698

**CO to PL: Leave local security and continue mission**

PL to CO: Reports enemy activity spotted by UAV

PL to SLs: Alerts platoon of enemy position and closing

**CO to PL: Establish hasty defense CAS will be deployed against tanks**

PL to CO: acknowledge

PL to SLs: Deploy in defensive posture

SLs to PL: acknowledge

**CO to PL: Enemy tanks have been destroyed, leave local security for disabled vehicle and continue mission**

PL to SLs: Leave security and continue mission

RNCO to PL: on UAV screen- enemy mortar position spotted at 835675

**PSGT to PL: Chemical agent detected**

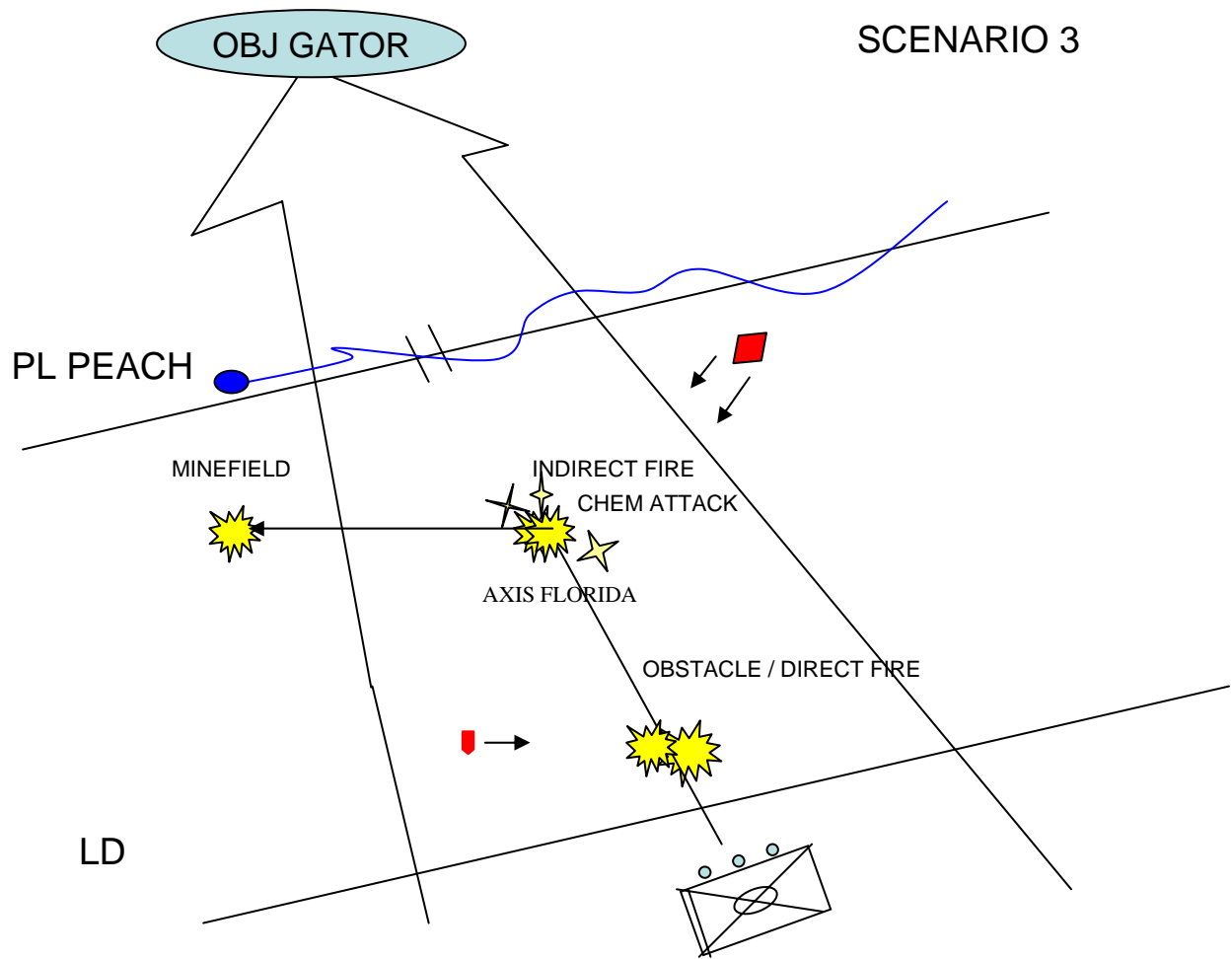
SL to PL: Receiving indirect fire

PL to SLs: Assume chemical posture, continue to move

PL to CO: Reports indirect fire contact, chemical agent

SL to PL: 2 casualties from chemical attack

**CO to PL: Break contact and conduct linkup with 1<sup>st</sup> platoon at pl Peach on axis Georgia**



### SCRIPT 3

(Bold text indicates when an alert was given)

(Blue text shows a sample of the unscripted platoon leader communications)

**CO: On order, cross LD and report when all elements are across**

PL to CO: Roger will report when all elements are across

PL to SLs: On order cross LD and report when all elements are across

SLs to PL: Acknowledges

**CO to PL: Cross LD now**

PL to SLs: Cross LD now

2nd SL to PL: 2<sup>nd</sup> Platoon has crossed LD

PL to CO: 2<sup>nd</sup> Platoon has crossed LD

1<sup>st</sup> SL to PL: Wire obstacle – need to go on road to avoid it

PL to CO: Reporting Obstacle

RNCO to PL: Reporting enemy observation post at Grid 864673

1<sup>st</sup> SL to PL: Receiving fire from op @ 10:00—engaging enemy at this time

**PSG to PL: Tank commander wounded from enemy fire/can continue mission**

PL to CO: Reporting contact with OP and casualty

WSL to PL: reports enemy destroyed

**CO to PL: destroy op and report**

RNCO to PL: Enemy tank section spotted by UAV at 3km and closing on their location @ grid location 844732

**PSG to PL: Reporting that casualties are stabilized and able to continue mission**

PL to CO: casualties are stabilized, enemy observation post destroyed, enemy tank section sighted @ grid location 844732

**CO to PL: Continue mission**

1stSL to PL: receiving indirect fire

RNCO to PL: tanks firing at us

**PSG to PL: 1<sup>st</sup> squad ICV is destroyed with no survivors**

PL to CO: reports indirect fire and destroyed vehicle and casualties

**CO to PL: FRAGO: Move south to axis Georgia link up with 1<sup>st</sup> platoon at PL peach**

2<sup>nd</sup> SL to PL: Chemical agent detected

PL to CO: reports presence of chemical agent

PL to SLs: gives change of mission- get into chemical posture

SL to PL: reports ICV hit mine and is immobile

RNCO to PL: tank section destroyed

**PSG to PL: Weapons squad ICV hit mine and is immobile**

**CO to PL: Self extract from mine field – consolidate and reorganize**

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## Appendix C. Alert Evaluation

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### Alert Evaluation

Participant \_\_\_\_\_ Scenario \_\_\_\_\_ Alert \_\_\_\_\_

Please rate the type of alert you received during this scenario.

---

Alert was  
effective at getting  
my attention :

☐

Strongly  
Agree

☐

Agree

☐

Neither agree  
nor disagree

☐

Disagree

☐

Strongly  
Disagree

---

Alert was helpful:

☐

Strongly  
Agree

☐

Agree

☐

Neither agree  
nor disagree

☐

Disagree

☐

Strongly  
Disagree

---

Alert was annoying  
and unnecessary:

☐

Strongly  
Agree

☐

Agree

☐

Neither agree  
nor disagree

☐

Disagree

☐

Strongly  
Disagree

---

Please answer the following questions:

In your opinion, what are the strengths (if any) of this type of alert?

In your opinion, what are the weaknesses (if any) of this type of alert?

If this type of alert is used in combat vehicles, what do you think it would be most useful for?

Other comments:

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## Appendix D. Alert Ranking

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### Alert Ranking

Participant \_\_\_\_\_

Please rank the visual, auditory, and tactile alerts for each category.

---

Effective attention getter: (1 = most effective, 2 = next most effective, 3 = least effective)

Visual \_\_\_\_\_ Auditory \_\_\_\_\_ Tactile \_\_\_\_\_

---

Helpful: (1 = most helpful, 2 = next most helpful, 3 = least helpful)

Visual \_\_\_\_\_ Auditory \_\_\_\_\_ Tactile \_\_\_\_\_

---

Please provide any additional comments you may have regarding the types of alerts and how they should be used.

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## Appendix E. Health and Demographics Questionnaire

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### Health and Demographics Questionnaire

Participant Number: \_\_\_\_\_ Date: \_\_\_\_\_

1. Are you currently on medical profile? (Circle One): Yes No

1a. If yes, please describe the problem(s) below:

\_\_\_\_\_

2. Do you have any other current condition or are you currently taking any medications that may prevent you from performing the tasks described to you in the volunteer consent form? (Circle One): Yes No

3a. If yes, please describe the ailment(s) below:

\_\_\_\_\_

3. What is your branch of service? (Circle One):

Air Force Army Marine Corps Navy Coast Guard

4. What is your age? \_\_\_\_\_

5. How long have you been in the service? \_\_\_\_\_ Years \_\_\_\_\_ Months

6. Please list below your MOS, ASI, NEC or AFS and briefly describe your job:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

6a. How long have you been performing this MOS, ASI, NEC or AFS? \_\_\_\_\_ years \_\_\_\_\_ months

7. What is your gender? (Circle One): Male Female

8. What is your education level? High School/GED: \_\_\_\_\_ Vocational Technical: \_\_\_\_\_ College: \_\_\_\_\_

9. What military schools have you attended (check all that apply): ☐ AIT ☐ BNCOC

☐ ANCOC ☐ WOBC ☐ Wheeled & Track Recovery Course

☐ M2/3 Family Fighting Vehicle Familiarization Course

☐ M1 Tank Familiarization Course ☐ Others \_\_\_\_\_

\_\_\_\_\_

10. What civilian schools have you attended? \_\_\_\_\_

\_\_\_\_\_

11. What positions have you held during your military tour? \_\_\_\_\_

\_\_\_\_\_

12. Do you have combat experience?

12a. If yes, identify location, time frame and your duty position.

<b>Geographic Area</b> (check all that apply)	<b>Duration of Tour</b>	<b>Did you see Combat?</b> circle either: yes/no	<b>If "YES"</b> Duty Position During Combat
Bosnia ( )	____years ____ months	yes/no	_____
Afghanistan ( )	____years ____ months	yes/no	_____
Iraq 1991 ( )	____years ____ months	yes/no	_____
Iraq 2003 ( )	____years ____ months	yes/no	_____
Other ( )	____years ____ months	yes/no	_____

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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## Appendix F. Operations Order (OPORD)

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### TASK ORGANIZATION:

Headquarters Platoon	1 <sup>st</sup> Platoon	2 <sup>nd</sup> Platoon
2 M998 HMMWV	5 ICV'S (PL-1,2,3SQUAD-WPNS SQUAD) 1UAV	5 ICV'S (PL-1,2,3SQUAD-WPNS SQUAD) 1UAV

### 1. SITUATION:

a. Effects of Terrain and Weather.

Terrain: Terrain favors the enemy. It provides excellent cover and concealment allowing the enemy to move forces on the battlefield unobserved. This results in the enemy being able to mount a counterattack from an unknown location. Additionally, friendly forces are forced to move mounted elements through choke points and roads.

b. Enemy Forces.

- (1) Disposition: Intelligence confirms that the 2/7 Kirtuq MRB(-) is conducting a hasty defensive operation to secure its NW penetration along Wildcat Road. Two companies are retreating and are believed to be blending back into the civilian population. The remnant of one company is defending in the vicinity of Big River. This is the company we will face. They are defending in less than platoon size elements. The company appears to have consolidated up to two sections of troops vic GL 805705. Over the past 24 hours a number of "freedom fighters" have reinforced the company defense, but are believed to fight independently and not abide by higher orders. The enemy is limited in its use of indirect fires. Due to the past 24 hours precision bombing campaign, a number of artillery positions were destroyed. However, a number of small caliber mortar systems and rounds are still at large, and can disrupt our forces as we move along the sector.
- (2) Composition: The 2/7 Kirtuq MRB (-) is comprised of both NATO and Warsaw Pact Equipment (see table F-1). The MRB (-) appears to be arrayed with only one reinforced company. Enemy forces are believed to be about 33-50% strength in personnel and equipment.
- (3) Strength: See table F-1.

Table F-1.

Unit	Main Weapon	Ranges	100 %	90%	80%	70%	60%	50%
<b>MRB (BMP)</b>								
Tank Co (1)	64A/72/80/90		10	9	8	7	6	5
BMP Co (3)	1/2/3		10	9	8	7	6	5
Mortar Btry	2B11-120mm or 2B9-82mm	7200m 5000m	6	5	5	4	4	3
Recon plt	BMP		3	3	2	2	2	1
ADA plt	BMP/SA-16s	6000m	3/9	3/8	2/7	2/6	2/5	1/4
AT plt	BMP AT-4/RPG22 or 26	2000m/1000m	3/6,3	3/ 5,3	2/ 5,2	2/ 4,2	2/ 4,2	2/ 3,1
AGS-17 plt	BMP/AGS 17	1250m	3/6	3/5	2/5	2/4	2/4	1/3
<b>MRC (BMP)</b>								
Tanks	T-64A/72/80/90		3	3	2	2	2	1
BMP	1/2/3		10	9	8	7	6	5
<b>MRP (BMP)</b>								
Tanks	T-64A/72/80/90		1	1	1	0	0	0
BMP	1/2/3		3	3	2	2	2	1
DIBS/sqd			7	6	5-6	5	4	3-4
RPG/RPK			3/3	3/3	3/3	3/3	3/3	3/3

## (4) Capabilities:

- (a) Maneuver: Enemy forces are transforming from an organized army to a reinforced "guerilla" force. Many of their organized tactics are being exchanged for more "hit and run" operations in an attempt to buy time for rearward troops to organize. The enemy does not have an identifiable front and therefore its difficult to estimate the number, and type of forces that we will confront.
- (b) Fire Support: The MRB(-) is likely to employ the remainder of his mortar battery in split sections to provide disrupting fires to the remaining company.
- (c) Intelligence: The enemy's formal intelligence assets have been largely neutralized. However, the enemy is likely to rely on human intelligence relayed by Kirtuq sympathizers. It is critically important that our forces do not interface with the civilian population IOT prevent operational information from getting in their hands.
- (d) Mobility, Counter-Mobility, Survivability: Very few obstacles remain in place. Most of the obstacles were reduced using indirect fires by the battalion scouts. However, remnants of some obstacles still remain on throughout the AO - vic. PL Peach (Box Springs Rd.) and GL 865675
- (e) Air Defense: The enemy is likely to have a large number of US made air defense weapon systems, such as the Stinger. These missiles can be employed against both our attack and support aviation assets. However,

in a desperate attempt, the enemy can attempt to employ these systems against our ICVs or light skinned vehicles.

- (f) Combat Service Support: The enemy does not possess an established CSS network. He relies heavily on support from the local civilian population for food, water and shelter, and is able to re-supply his forces through a growing network of foreign insurgents.
  - (g) Command and Control: The enemy's formal organization of troops is currently being diminished. Their leadership's inability to properly sustain them throughout the war has created large instability within their chain of command. Furthermore, the outside "freedom fighters" that have come to fight against US troops have undermined the existing chain of command, and has recently created a separate network of cells that conduct operations independently from the conventional forces.
- (5) Enemy's most probable course of action is to continue conducting operations in platoon or smaller size elements. They will delay our advance by disrupting our forces along the route. The enemy is most likely to employ man-portable anti-armor weapons such as RPGs. In addition, the enemy is likely to employ IEDs to disrupt our forces and delay our movement. The enemy has a limited number of forward observers, so we can expect him to focus his indirect fire assets on known points such as road intersections and hilltops.
  - (6) Decisive to the enemy's operation is his ability to disrupt our forces along the route, and prevent our forces from pinpointing his exact location.
  - (7) He will accomplish this by operating in less than platoon size elements (Section or  $\leq$ ), conducting anti-armor ambushes, and blending into the civilian population. Therefore deceiving our troops as to their exact disposition.
  - (8) The purpose of his fires is to disrupt.
  - (9) The purpose of his engineers is to Counter-Mobility.
  - (10) Enemy's most dangerous course of action is the employment of chemical weapons (blister or nerve agents) delivered using man-portable indirect fire systems such as 81/120mm mortars. This will not only deny us the ability to move along the sector, but it will severely delay our advance, and provide the enemy time to reinforce.

c. Friendly Forces:

- (1) Higher Unit's Mission and Commander's Intent:
  - (a) 2 Levels Up: 29<sup>TH</sup> IN Regt.
    - 1. Mission: Seize the town of Lenardwood IOT prevent enemy forces from establishing an operational logistical network.
    - 2. CDRs Intent: Secure Highways 280, 137, & 27
  - (b) 1 Level Up: 1-29<sup>th</sup> (Mech)
    - 1. Mission: Seize OBJ Darby IOT prevent enemy forces from organizing and mounting terrorist attacks against our troops.
    - 2. CDRs Intent: Deny the enemy the ability to prepare and sustain his forces. Maintain the initiative to force the enemy to continue

disorganizing, but prevent his forces from blending back into the civilian population.

- (2) Left Unit's Mission: A/1-29<sup>th</sup> destroys enemy forces in AO Snickers to prevent enemy forces from mounting offensive operations against the battalion main effort.
- (3) Right Unit's Mission. A/2-79<sup>th</sup> AR destroys enemy forces in AO Milky Way to prevent enemy forces from mounting offensive operations against the battalion main effort.
- (4) Rear Unit's Mission. B/1-29<sup>th</sup> (ME) seize OBJ Darby IOT prevent enemy forces from organizing and mounting terrorist attacks against our troops.
- (5) Forward Unit's Mission: BN Scouts screen to prevent enemy forces from conducting surprise attacks against our troops.

d. Attachments and Detachments: 3<sup>rd</sup> PLT attached to A/2-79 AR until 05 1200 APR 04.

**2. MISSION:** O/O C/1-29<sup>th</sup> (Mech) seize OBJ Tiger (GL 795698) IOT prevent the 2/7 MRB (-) from mounting offensive operations against the battalion main effort.

### **3. EXECUTION:**

- a. Company Commander's Intent: I intend to seize OBJ Tiger by maintaining the initiative and force the enemy to continue his withdrawal. Our forces will move along the designated routes with speed to prevent the enemy from disrupting our advance. The endstate of this operation is OBJ Tiger seized, our forces placed in hasty defensive positions and prepared to conduct further offensive operations.
- b. Concept of the Operation: We will accomplish this by conducting an envelopment. The decisive point of this operation is the seizure of OBJ Bulldog. It is decisive because it will deny enemy forces observation and the ability to place effective fires on the main effort. One platoon will maneuver along the East (Axis Georgia) to seize OBJ Bulldog. One platoon will maneuver along the West (Axis Florida) to seize OBJ Gator.

(1) Maneuver.

(a) O/O, 1<sup>st</sup> PLT (SE) moves along Axis Georgia to seize OBJ Bulldog (GL 805679) IOT prevent the enemy from placing effective fires on 2<sup>nd</sup> PLT (ME).

(b) O/O 2<sup>nd</sup> PLT (ME) moves along Axis Florida to seize OBJ Gator (GL 805695) IOT prevent the 2/7 MRB (-) from mounting offensive operations against the battalion main effort.

(2) Fires.

(a) Task: Suppress

(b) Purpose: Prevent the enemy from massing direct fires.

(c) Method:

- 1. AA to LD (PL Orange) – CO HQ
- 2. PL Orange to PL Peach – 1<sup>st</sup> PLT
- 3. PL Peach to PL Lime – 2<sup>nd</sup> PLT

- (3) Engineer. N/A
- (4) Air Defense: N/A

c. Tasks to Maneuver Units:

- (1) 1<sup>st</sup> PLT (SE):
  - (a) Seize OBJ Bulldog.
  - (b) Establish a hasty perimeter oriented SE after OBJ Tiger is seized, and occupy SBF #1.
  - (c) B/P to pass B/1-29<sup>th</sup> IN (BN ME) to the south.
  - (d) Report all obstacles along Axis Georgia. Open a lane or establish a bypass and mark with white engineer tape on the left side of the lane.
- (2) 2<sup>nd</sup> PLT (ME):
  - (a) Seize OBJ Gator.
  - (b) Establish a hasty perimeter oriented SW after OBJ Tiger is seized, and occupy SBF #2.
  - (c) Report all obstacles along Axis Florida. Open a lane or establish a bypass and mark with white engineer tape on the left side of the lane.

d. Tasks to Combat Support Elements:

- (1) FSO:
  - (a) Allocate three targets per maneuver element and assist in fire support planning.
  - (b) Develop fire support matrix.
  - (c) Establish NFAs to prevent fratricide and assist in clearance of fires.

e. Coordinating Instructions:

- (1) Time Line:
  - 14 1800– CO OPORD
  - 15 1300– UAV Flyover/CO BACKBRIEFS
  - 15 2000– NLT PLT OPORD
  - 15 2100– NLT PCIs
  - 15 2200– NLT PLT REH
  - 16 0500– STAND TO
  - 16 0530– PCCs
  - 16 0800– 2<sup>nd</sup> PLT Cross LD
  - 16 0830– 1<sup>st</sup> PLT Cross LD
  - 16 1100– OBJ Tiger Seized
  - 16 1200 A– NLT Occupy SBF
- (2) CCIR.

- (a) PIR:
1. Location and strength of enemy forces along Axis Florida and Axis Georgia.
  2. Strength of counterattack and direction of movement.
  3. Identify type and size of obstacles along Axis Florida and Axis Georgia.

(b) EEFI:

1. Location of key leaders.
2. Location of company trains.

(c) FFIR:

1. Location of possible IEDs.
2. Loss of one or  $\geq$  infantry squads.
3. Civilians on the Battlefield (COB).

(3) Risk Reduction.

(a) MOPP: Level 0

(b) Passage of Lines with B/1-29<sup>th</sup> IN will be on order and lane will be marked with white engineer tape.

(c) Main effort will conduct final assault after 1<sup>st</sup> PLT has seized OBJ Bulldog.

(d) Maintain nametag defilade at all times while moving in the BFV.

(e) Do not move in the BFV if internal communication is lost between the BC and the driver.

(4) ROE.

(a) Maintain 50M between personnel and vehicle engagements and 10M between personnel engagements. "Close Kill" within 10M.

(b) Engagement Priorities: See table F-2.

Table F-2.

WEAPON	1st PRIORITY	2nd PRIORITY	3rd PRIORITY
25mm BFV	PC	Truck	Troops
TOW	Tanks	PC	Truck
M47	PC	Truck	POVs
AT-4	PC	Truck	POVs
COAX/M240	Troops	Truck	POVs

(c) Disengagement Criteria: Destruction of two or more ICVs.

(d) Environmental Considerations: A number of historical burial grounds/sensitive areas are in our AO. They are marked with white signs. They are off-limits for vehicle movement. If you find yourself in one of these areas move out as fast as tactically possible. Report any POL product spills to a cadre member.

- (5) Force Protection.
  - (a) Direct Fire Control Measures:
    - 1. PL Sugar – Shamanski Rd.
    - 2. PL Orange – Resaca Rd.
    - 3. PL Peach – 1<sup>st</sup> Division Rd.
    - 4. PL Lime – Helmet Trail.
  - (b) Rehearsal Priorities:
    - 1. Actions on OBJ
    - 2. Actions on Contact
    - 3. Crossing Danger Areas
    - 4. Establish and Mark a Lane

#### 4. SERVICE SUPPORT:

**a. Concept of Support:** Company trains will remain in AA and displace O/O. Certain elements of the company trains, such as communications and medics, will move forward, but remain one phase line behind the company team. Company trains will conduct emergency re-supply once OBJ Tiger is seized. Priority of re-supply is 2<sup>nd</sup> PLT, 1st PLT, & HQ. Priority of rearward movement is to friendly casualties, NMC vehicles, and lastly EPWS.

#### **b. Materials and Services.**

- (1) Class I:
  - (a) Ration Cycle: M/M/M (CL I will be pushed forward during LOGPAC)
  - (b) Water: Vehicles will carry 5 gal of water minimum
- (2) Class II: None for 48 hours.
- (3) Class III: Vehicles will refuel during LOGPAC.
- (4) Class IV: Limited supply at the company trains (AA). Coordinate with cadre for equipment required.
- (6) Class V: Coordinate with cadre for required amount. Ammo will be pushed forward during LOGPAC.
- (7) Class VI: None for 48 hours.
- (8) Class VII: The Company maintains two M2A2 ODS floats at the AA.
- (9) Class VIII: None for 48 hours.
- (10) Class IX: Will be pushed forward during LOGPAC.

#### **c. Medical Evacuation and Hospitalization (CASEVAC).**

- (1) Company CCP:
  - (a) Enroute: PL Peach
  - (b) OBJ: OBJ Bulldog

- (2) Casualty Marking: Tracked vehicles with wounded or KIA will be marked with a Red Cross on both sides and in the front to allow priority of movement on MSR.

d. EPWs.

- (1) EPW collection point is located at PL Peach
- (2) EPWs will be treated IAW Geneva Convention and the 5S.

e. Personnel.

- (1) **Available replacements will be sent forward from company trains to the platoons at OBJ Tiger during consolidation & reorganization.**

5. COMMAND AND SIGNAL:

a. Command.

- (1) Company Commander will move one phase line behind the ME (& SE).
- (2) Succession of Command: XO (notional), 2<sup>nd</sup> PL, 1<sup>st</sup> PL, CO 1SG (notional).

b. Signal.

- (1) Frequencies:
  - (a) BN CMD: 31.100
  - (b) BN A&L: 41.500
  - (c) CO CMD: 34.550 (Team #1) / 37.850 (Team #2)
  - (d) 1<sup>st</sup> PLT: 41.300
  - (e) 2<sup>nd</sup> PLT: 79.900
  - (f) CO FS: 36.350
- (3) Red Star/smoke casualty and request for medical evacuation. White smoke represents effects of friendly indirect fires.

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